WHAT IS CLAIMED IS:

1. A data transmission device of a radio communication system having a radio link control (RLC) layer, comprising:

a transmission data reassembling module that reassembles service data units (SDUs) received from an upper layer into protocol data units (PDUs);

a header adding module that adds headers of the RLC layer to the reassembled PDUs;

a transmission data storing module that stores the PDUs to which the headers are added; and

a ciphering module that ciphers the PDUs to which the headers are added and then transmits the ciphered PDUs to a lower layer.

2. The data transmission device of claim 1, wherein the SDUs are transmitted to the transmission data reassembly module through an UM-SAP from the upper layer and the ciphered PDUs are transmitted from the data transmission device to a receiving RLC entity of the radio communication system through DTCH, DCCH, CCCH, SHCCH, and CTCH channels.

3. The data transmission device of claim 1, wherein the transmission data reassembly module includes a segmentation and concatenation module that segments and concatenates the SDUs transmitted from the upper layer.

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4. The data transmission device of claim 1, wherein the headers include sequence numbers of the RLC layer.

5. The data transmission device of claim 1, further comprising a data retransmission control module that controls retransmission and in which the PDUs to which the headers are added by the header adding module are stored for retransmission.

6. The data transmission device of claim 5, further comprising a multiplexer that provides either a first output signal from the header adding module or a second output signal from the data retransmission control module to the transmission data storing module.

7. The data transmission device of claim 5, further comprising a header field setting module that sets fields of the headers in the PDUs stored in the transmission data storing module and transmits the set header fields to the ciphering module.

8. The data transmission device of claim 5, wherein the SDUs are transmitted to the transmission data reassembly module, through an AM-SAP, from the upper layer and the ciphered PDUs are transmitted from the data transmission device to a receiving RLC entity of the radio communication system through DTCH, DCCH, CCCH, SHCCH, and CTCH channels.

9. The data transmission device of claim 5, wherein:

the ciphering module checks D/C fields in the headers of the PDUs before performing the ciphering;

the ciphering module does not cipher control PDUs but does cipher all other PDUs, including piggybacked status PDUs, in accordance with values of the D/C fields; and

the ciphering module transmits the control PDUs to an RLC control module.

10. The data transmission device of claim 5, wherein the ciphering module replaces a PAD within the PDUs with a number of piggybacked status PDUs.

11. A data receiving device of a radio communication system having a radio link control (RLC) layer, comprising:

a deciphering module that deciphers received ciphered protocol data units (PDUs) of the RLC layer, through a lower layer, into deciphered PDUs;

a received data storing module that stores the deciphered PDUs;

an RLC header removing module that removes headers of the RLC layer from the deciphered PDUs; and

a reassembly module that reassembles the deciphered PDUs outputted from the RLC header removing module into service data units (SDUs) and then transmits the SDUs to an upper layer.

12. The data receiving device of claim 11, wherein the ciphered PDUs from a transmitting side are transmitted to the data receiving device through DTCH, DCCH, CCCH, SHCCH, and CTCH channels and the reassembled SDUs are transmitted to the upper layer through an UM-SAP.

13. The data receiving device of claim 11, wherein the headers include sequence numbers of the RLC layer.

14. The data receiving device of claim 11, further comprising a data retransmission control module that controls retransmission of ciphered PDUs to the data receiving device.

15. The data receiving device of claim 14, further comprising a header data reading module that reads the headers removed by the RLC header removing module.

16. The data receiving device of claim 15, wherein the deciphering module transmits control PDUs of the ciphered PDUs to an RLC control unit without attempting to decipher the control PDUs and deciphers AMD PDUs only.

17. The data receiving device of claim 16, wherein the deciphering module does not decipher the control PDUs but does decipher other PDUs, including piggybacked status PDUs,

in accordance with values of D/C fields in the headers and transmits the control PDUs to the RLC control module.

18. The data receiving device of claim 15, wherein the ciphered PDUs are transmitted to the data receiving device through DCCH and DTCH channels and the reassembled SDUs are transmitted to the upper layer through an AM-SAP.

19. The data receiving device of claim 15, wherein the deciphering module includes a deciphering block and a demultiplex/routing block for transmitting control PDUs of AMD PDUs received from a transmitting side to an RLC control module and transmitting other AMD PDUs to the deciphering block.

20. The data receiving device of claim 19, wherein the demultiplex/routing block checks a D/C field within the AMD PDUs to determine whether the AMD PDUs are the control PDUs or the other AMD PDUs.

21. The data receiving device of claim 15, wherein the RLC header removing module removes the headers of the RLC layer and piggybacked information from AMD PDUs transmitted from the received data storing module.

22. A data transmission device of a radio communication system having a radio link control (RLC) layer, comprising:

a transmission data storing module that stores service data units (SDUs) received from an upper layer;

a transmission data reassembly module that reassembles the stored SDUs into protocol data units (PDUs) of the RLC layer;

a header adding module that adds headers of the RLC layer to the reassembled PDUs; and

a ciphering module that ciphers the PDUs to which the headers are added and then transmits the ciphered PDUs to a lower layer.

23. The data transmission device of claim 22, wherein the SDUs are transmitted to the transmission data storing module through an UM-SAP from the upper layer and the ciphered PDUs are transmitted from the data transmission device to a receiving RLC entity of the radio communication system through DTCH, DCCH, CCCH, SHCCH, and CTCH channels.

24. The data transmission device of claim 22, wherein the transmission data reassembly module includes a segmentation and concatenation module that segments and concatenates the SDUs transmitted from the upper layer.

25. The data transmission device of claim 22, wherein the headers include sequence numbers of the RLC layer.

26. The data transmission device of claim 22, further comprising a data retransmission control module that controls retransmission and in which the PDUs to which the headers are added by the header adding module are stored for retransmission.

27. The data transmission device of claim 26, further comprising a multiplexer that provides either a first output signal from the header adding module or a second output signal from the data retransmission control module to the transmission data storing module.

28. The data transmission device of claim 26, further comprising a header field setting module that sets fields of the headers in the PDUs stored in the transmission data storing module and transmits the set header fields to the ciphering module.

29. The data transmission device of claim 26, wherein the SDUs are transmitted to the transmission data storing module, through an AM-SAP, from the upper layer and the ciphered PDUs are transmitted from the data transmission device to a receiving RLC entity of the radio communication system through DTCH, DCCH, CCCH, SHCCH, and CTCH channels.

30. The data transmission device of claim 26, wherein:

the ciphering module checks D/C fields in the headers of the PDUs before performing the ciphering;

the ciphering module does not cipher control PDUs but does cipher all other PDUs, including piggybacked status PDUs, in accordance with values of the D/C fields; and

the ciphering module transmits the control PDUs to an RLC control module.

31. The data transmission device of claim 26, wherein the ciphering module replaces a PAD within the PDUs with a number of piggybacked status PDUs.

32. A method for transmitting data in a radio communication system having a radio link control (RLC) layer, comprising:

reassembling service data units (SDUs) received from an upper layer into protocol data units (PDUs);

adding headers of the RLC layer to the PDUs;

storing the PDUs to which the headers are added in a transmission data storing buffer;

ciphering the PDUs to which the headers are added; and

transmitting the ciphered PDUs to a lower layer.

33. The method of claim 32, wherein the SDUs are transmitted to a transmission module through an UM-SAP from the upper layer and the ciphered PDUs are transmitted from the

transmission module to a receiving RLC entity of the radio communication system through DTCH, DCCH, CCCH, SHCCH, and CTCH channels.

34. The method of claim 32, wherein reassembling the SDUs includes segmenting and concatenating the SDUs transmitted from the upper layer.

35. The method of claim 32, further comprising storing the PDUs to which the headers are added as retransmission PDUs and controlling retransmission of the retransmission PDUs.

36. The method of claim 35, further comprising multiplexing the PDUs to which the headers are added and the retransmission PDUs as combined PDUs and transmitting the combined PDUs to the transmission data storing module.

37. The method of claim 35, further comprising setting fields of the headers in the PDUs to which the headers are added, before ciphering the PDUs.

38. A method for receiving data in a radio communication system having a radio link control (RLC) layer, comprising:

deciphering ciphered protocol data units (PDUs) of the RLC layer transmitted from a transmitting side, through a lower layer, into deciphered PDUs;

storing the deciphered PDUs in a receiving data storing buffer as PDUs;

removing headers of the RLC layer from the PDUs;

reassembling the PDUs of the RLC layer, from which the headers are removed, into service data units (SDUs); and

transmitting the reassembled SDUs to an upper layer.

39. The method of claim 38, wherein the ciphered PDUs from the transmitting side are transmitted to a data receiving device through DTCH, DCCH, CCCH, SHCCH, and CTCH channels and the reassembled SDUs are transmitted to the upper layer through an UM-SAP.

40. The method of claim 38, further comprising controlling retransmission of the ciphered PDUs.

41. The method of claim 40, further comprising reading the removed headers.

42. The method of claim 41, wherein the deciphering of the ciphered PDUs includes transmitting control PDUs of the ciphered PDUs transmitted from the transmitting side to an RLC control module and deciphering AMD PDUs only.

43. The method of claim 40, wherein the ciphered PDUs are transmitted to a data receiving device through DCCH and DTCH channels and the reassembled SDUs are transmitted to the upper layer through an AM-SAP.